

THE INFLUENCE OF PRIOR CONTACT WITH THE  
EXPERIMENTER ON CHILD PERFORMANCE

By

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This study was undertaken in order to determine the extent to which a short positive relationship between a child and an adult influences subsequent child performance. Second and third grade boys were randomly assigned to three conditions: (1) prior contact, (2) prior contact control, and (3) no prior contact. Prior contact consisted of two periods one approximately a half hour in length taking place after the baseline period, and the second approximately twenty minutes long taking place immediately before the test period. In the prior contact control condition, these same stipulations were maintained. In this condition, however, prior contact was with a completely different experimenter, one who did not participate in the baseline nor test period. In the no prior contact condition, no child-experimenter social interaction occurred between baseline and test periods. Every subject

was asked to complete two tasks which differed in terms of complexity in an intratask competition sense.. The tasks were given twice, once in the baseline portion of the study and again after the conditions of prior contact were implemented. As expected reward conditions were a significant factor in the determination of rates of responding. It ✓ was also shown that prior contact alone is not a significant determiner of responding, but rather interacts with type of reward and type of task to influence child performance. The lengths of prior contact used had some effect on the no reward and social reward conditions, but the influence was only significant in the no reward condition. For this latter condition, prior contact resulted in increased levels of responding. Prior contact had a facilitating influence on the "complex task" and an equivocal effect on the "simple task." Since prior contact appears to interact with both reward and task variables, a dual mechanism is suggested as underlying its effects. This dual mechanism may be based on the incentive value of prior contact and its capacity for the reduction of anxiety.

CHAPTER I  
INTRODUCTION

Until recently few experimental studies in psychology have systematically examined the influence of the experimenter on his subjects. Rosenthal (1966) has cogently presented evidence for the pervasiveness of the experimenter effect in psychological research. He indicates that certain characteristics of the experimenter frequently are instrumental in shaping the results of psychological investigations with both human and animal subjects. The researcher is an integral part of the stimulus situation confronting the subject and as such his actions, his suggestions, and even his mere presence may exert an extremely strong influence<sup>1</sup> on his subjects' performance. This particularly seems to be the case with adult experimenters and child subjects (Bijou and Baer, 1966). Children seem to be most susceptible to the suggestions and expectations of adults.

An entire area of psychological research, that of social reinforcement with children, supports the above contention. This area of research reveals that the social reinforcing effectiveness of an adult varies systematically with a number of characteristics (Stevenson, Keen and Knights, 1963). Such factors as the experimenter's sex, age, race and his acquaintanceship with his subject, all appear to influence a child's

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<sup>1</sup>The influence is a strong one but not a ubiquitous one (T. X. Barber, et al., 1969).

responding in experimental situations (Allen, Dubanski, and Stevenson, 1966; Rosenthal, 1966). The present analysis attempts to investigate the influence of these adult experimenter characteristics upon the performance of child subjects. It focuses on an aspect of one of these characteristics and views it in relation to other variables which have been empirically determined to be relevant to its influence. This characteristic is often called experimenter acquaintanceship (Rosenthal, 1966), is also referred to as experimenter familiarity, (Rosenkrantz and Van De Riet, in press) and is also termed prior contact between experimenter and subject (Berkowitz, Butterfield and Zigler, 1965). The aspect of this characteristic which is of primary concern here is that of positive prior contact between the subject and the experimenter. The first step in the analysis of the effects of this characteristic is a review of the relevant literature.

Rosenthal (1966) has indicated that this variable is one which influences subject performance in predictable ways. He has hypothesized a relationship between positive prior contact and task difficulty which stipulates as its first basic tenet that if the performance required is difficult, prior contact seems to improve performance. Sacks (1952), using three year olds, found that intellectually challenging tasks were performed better after prior contact with the experimenter. Kanfer and Karas (1959), working with college students, investigated the effects of prior contact on the conditioning of first person pronouns. If it can be assumed that learning the contingency in a verbal conditioning experiment is somewhat challenging intellectually, then the results of this study are consistent with Rosenthal's hypothesis. In a study by Kass

and Stevenson (1961), subjects in a high success pre-training condition who received material and social rewards emitted a greater number of correct responses during the testing period. The Kass and Stevenson task was a discrimination problem which had been found to be difficult for the mental age level of the children used as subjects.

As the second tenet of Rosenthal's hypothetical relationship between prior contact and task complexity, he states that when the performance required is simple, positive prior contact seems to decrease performance. Stevenson, Keen and Knights (1963) report that a stranger was found to have more social reinforcing effectiveness than a child's parents.<sup>2</sup> Berkowitz (1964) found that normal subjects who had prior contact either warm or cold in character were slower in reacting than were normal subjects who had no prior contact. Berkowitz also found that for schizophrenic subjects positive prior contact resulted in decreased performance on the simple reaction-time task employed. In addition, Rosenkrantz and Van De Riet (in press) found that positive prior contact as compared with no prior contact results in a decrease in performance for material reward on a simple task.

Rosenthal (1966) feels that a possible mechanism for the influence of prior contact is in terms of the relationship between subject anxiety and task difficulty. Prior contact may serve to lower subject anxiety about being contacted by a stranger. This seems to be a more appropriate explanation for younger children but can be extended to

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<sup>2</sup>The quality of prior contact is a strong consideration here.

older subjects, since many subjects find participation in psychological studies anxiety producing (Spielberger, 1966). The absence of prior contact may result in an increase in subject anxiety in the presence of a strange experimenter. In support of Rosenthal's explanatory mechanism, Child (1954) indicates that the most plausible general interpretation of the findings about anxiety and task complexity is that the disruptive effects of various responses to anxiety vary with the nature of the task. In simple conditioning, or learning, where a stable relationship is established between stimulus and response, the internal responses the subject is making as a function of anxiety provoking stimuli do not have any great interfering effect. The presence of a high drive level (high anxiety) in the simple situation does make for heightened performance. On the other hand in complex situations, where the subject is already in conflict between various response tendencies relevant to the task, the presence of irrelevant internal responses as a function of anxiety provoking stimuli heightens the conflict. This situation therefore interferes with performance to a greater extent than the increased drive improves it.

In support of Child's interpretation, a number of studies (Farber and Spence, 1953; Montague, 1953; Taylor, 1951; Taylor and Spence, 1952), using the Taylor scale of manifest anxiety as a measure of motivation or drive have attempted to relate the effects of different motivational levels to performance of subjects in a variety of learning situations. The results of these experiments suggested that the performance of high anxious subjects, when compared with low anxious subjects, is superior in simple learning situations such as classical conditioning but inferior

on more complex tasks such as trial and error learning (Palermo, Castaneda, and McCandless, 1956).

More recently, Taylor and Spence (1966) indicate that the conception of the relationship between anxiety and task difficulty summarized above is an oversimplification of their theoretical position. They indicate that one of the most common misunderstandings of their work has involved the translation of degree of intratask competition between correct and incorrect response tendencies into level of task "complexity." Also, included within this misconception is an accompanying statement that the evidence shows that as complexity increases high anxiety group performance becomes increasingly inferior to low anxiety group performance. It is true, of course, that other things being equal, tasks of increasing degrees of intratask competition could also be described as becoming increasingly complex. However, varying competition is only one dimension of complexity. Even more frequent have been statements that the theory predicts that the direction of the performance difference between high and low anxiety groups is a function of task "difficulty." However, just as in the case of the complexity variable there are a number of ways to vary task difficulty that do not involve manipulating intratask competition and about which the Taylor-Spence (1966) theory makes no differential predictions. When the data from numerous studies done by Taylor and Spence are considered together, it is clear that the assumed relationship between task difficulty per se and anxiety is not confirmed. Grossman (1968) using a simple task with first grade boys indicates that with one measure of anxiety he finds the low anxious group responding more, but with a second measure of anxiety he finds an

opposite, although not significant, trend. The data do not support the statements that have been made about the interaction between task complexity per se and level of drive or anxiety. In evaluating the results regarding anxiety and complex learning studies, it is necessary to acknowledge that despite extensive investigations our understanding of the variables is woefully deficient (Spielberger, 1966). The empirical findings have demonstrated all varieties of relationships, suggesting that anxiety producing situations are complex in their effects and interact with a number of additional variables to determine performance. As is quite apparent from this discussion, there is no single empirical function that describes the relationship between performance and any given set of independent variables defining drive level or anxiety.

In consideration of the conflicting research concerning Rosenthal's proposed mechanism, it becomes necessary to consider alternatives which examine and account for more of the data. In addition to the conflicting data regarding the possible mechanism, that of subject anxiety, there exist other studies which do not even fit into his general hypothetical classification. The most vulnerable tenet of his hypothesis stipulates that prior contact in conjunction with a simple task results in decreased levels of responding. Various studies have found no difference or the opposite result (Berkowitz and Zigler, 1965; Berkowitz, Butterfield and Zigler, 1965; McCoy and Zigler, 1965; Rosenkrantz, Jaffee and Van De Riet, 1969; Stevenson and Hill, 1965). These inconsistent and conflicting results require further specification of the additional variables which apparently interact with prior contact to determine its effects.

The most obvious dimension or set of variables which should next be considered is that of the consequences for, or more specifically, the rewards for responding in studies involving prior contact. Three types of consequence conditions will be considered: verbal praise, or a social reward condition, a material reward condition, and a no reward condition.

The results for the no reward condition seem to be the most clear cut. Sacks (1952) in her study of three year olds found that prior contact resulted in increased levels of responding. This was the case even for a less favorable (neutral) form of prior contact. Kass and Stevenson (1961) using both retarded and normal children found that positive prior contact resulted in increased performance. Rosenkrantz, Jaffee, and Van De Riet (1969) found that college students responded at higher levels in a no reward condition after prior contact than they did in a no reward condition without prior contact. Sgan (1967) found somewhat in contrast to her original expectation that positive prior contact in a no reinforcement condition resulted in increased responding.

The influence of prior contact in studies where social reward is being dispensed is more variable and therefore appears to be more complex. A number of studies have indicated that familiarity or prior contact with a supportive adult established during a pre-training period reduces the effectiveness of the adult as a social reinforcer of subsequent performance (Gewirtz and Baer, 1958; Shallenberger and Zigler, 1961; Stevenson and Knights, 1962; Stevenson, Keen, and Knights, 1963). These results along with additional studies (Berkowitz, 1964; Erickson, 1962; Simkins, 1961) have been taken together to support a theoretical position known as "social drive" or "satiation." Gewirtz (1967) has

discussed variables such as prior contact as "setting conditions." Until recently, short-term deprivation-satiation relations were thought by many to hold uniquely for appetitive stimuli, but functional relations like these have been found to hold for a variety of non-appetitive stimuli. Although the mechanism in satiation (and for that matter deprivation) is not fully understood, learning is thought to modify the satiation function by establishing a maintenance level based on a long-term pattern of stimulus receipt. The maintenance level is believed to function as a reference standard to determine the impact of any correct level of social stimulation (Gewirtz, 1967). Baron (1966) has proposed that a subject acquires a preference level for social reinforcers on the basis of past schedules against which he judges the adequacy of the current rate of reinforcement. Substantial disparities above or below the preference level for reinforcer receipt lead the subject to correct the disparities.

In contrast to the results of the studies supporting a strict "satiation position" are those which have found that positive prior contact results in increases in responding for social reward. This position can be referred to as the "valence position" (Berkowitz, Butterfield and Zigler, 1965; Berkowitz and Zigler, 1965; McCoy and Zigler, 1965). The "valence position" has asserted that the nature of the prior social interaction influences the valence which the experimenter has for his subjects. Within this framework, a positive interaction is viewed as enhancing and a negative interaction is viewed as attenuating the experimenter's effectiveness as a reinforcing agent. In support of this position, McCoy and Zigler (1965) found that positive

prior contact resulted in their subjects playing an experimental game significantly longer for social reinforcement than those who received no prior contact. Berkowitz and Zigler (1965) have shown that the delay of the test period after preliminary contact results in significant changes in the effectiveness of positive prior contact. This finding resolves to some extent the apparent conflict between the McCoy and Zigler (1965) study and earlier research which had found that prior contact resulted in a decrease in performance for social reinforcement (Gewirtz and Baer, 1958). It is apparent that this theoretical position can be seen as a special case of the "social drive" or "satiation position." If the time between prior contact and the test period is short, the conditions for satiation are upheld. If this time is longer, the conditions for satiation are not met, and therefore a different set of conditions influence responding.

Other studies appear to directly support the "valence position" in their findings that a successful pre-training experience results in an increase in child responding (Kass and Stevenson, 1961; Stevenson and Hill, 1965). Such considerations as a lack of social reinforcement for responding during the test period (Kass and Stevenson, 1961) and the omission of a no prior contact condition for a comparison (Stevenson and Hill, 1965) make these findings somewhat inconclusive with regard to the "satiation" vs. "valence" argument. Another analysis which on the surface appears to support the "valence position" is the previously mentioned Sgan (1967) study. Here again since no social reinforcement was dispensed during the test period, the study's results are somewhat inconclusive with regard to this theoretical issue.

The third type of consequence used in studies considering positive prior contact is material reward. Dorart *et al.* (1965) have data to suggest that some social and material rewards may have equivalent effects when the experimenter attempts to establish a warm nonthreatening atmosphere prior to the test period. Simkins (1961) using college students found that positive prior contact resulted in no change in the effectiveness of material reward. Rosenkrantz and Van De Riet (in press), using second and third graders, found that positive prior contact resulted in decreased responding on a simple task for material reward (relative to no positive prior contact). Erickson (1962) found that fifteen minutes of positive prior contact with six graders made no significant difference in the effectiveness of a marble reward, but this was in relation to a neutral condition of prior contact and not to the absence or prior contact. Since the variables involved in the influence of prior contact on material reward are not yet clearly delineated nor are the experimental results consistent, it is difficult to speculate as to the theoretical mechanisms involved. The present research will hopefully shed additional light on this area.

An additional set of variables affecting the influence of positive prior contact on responding is specified by the age of the subjects employed. Most psychological investigations which consider the influence of prior contact have used young children as subjects. Collectively, these studies appear to indicate that the influence of prior contact on child performance varies as a function of reward and task conditions. The conclusions drawn from studies of prior contact with older subjects are somewhat different.

The interaction between prior contact and reward conditions occurs in college students. In contrast to the findings with younger subjects, the results in the no reward condition are not as clearcut, prior contact results in both increased responding for college students (Rosenkrantz, Jaffee, and Van De Riet, 1969) and decreased responding for hospital patients (Berkowitz, 1964). The results regarding material reward seem to be fairly consistent for older subjects. The lengths of prior contact employed do not appear to have had a statistically significant effect on material rewards (Simkins, 1961; Rosenkrantz, Jaffee, and Van De Riet, 1969). This apparently is not the case with younger children (Rosenkrantz and Van De Riet, in press). The influence of prior contact on social reward conditions may be more variable with older subjects (Berkowitz, 1964). Prior contact does not appear to have a debilitating influence on the effect of social rewards for older subjects (Berkowitz, 1964; Frey, 1967; Kanfer and Karas, 1959).

The interaction between prior contact and task conditions did not occur in the study by Rosenkrantz, Jaffee, and Van De Riet (1969) although there is evidence for it in the literature (Berkowitz, 1964). It is possible that fairly extensive differences in task difficulty are required before this interaction shows up with older subjects. With tasks of less than large differences in difficulty or complexity, the reward variables appear to have an overriding influence.

Taking the data from the studies of prior contact and generalizing from it certain conclusions can be drawn. First, it appears that the type of task does have some effect on the influence of prior contact (especially with young children). The data are fairly consistent regarding

the facilitating effect on complex tasks but somewhat more equivocal regarding the debilitating effect on simple tasks. This is the case since some of the studies which have found that prior contact can result in increased responding have found this to be the case with simple tasks. It is also apparent that the results of prior contact vary as a function of the type of reward condition being considered. The results are presently the most clear cut in the case of the no reward condition in which prior contact seems most often to have a facilitating effect. In the case of the social reward, the results are more variable and depend upon additional conditions, but in general support a "social drive" or "satiation" position. In the case of material reward, the data are not completely consistent and further work is necessary before a theoretical basis can be developed to account for the empirical findings.

This study will attempt to more clearly specify the relationships between the variables concerning child performance and positive prior contact. In this analysis the adult experimenters were viewed under three conditions of reward: material reward (marbles); social reward (praise); and a no reward condition. This study will attempt to shed light upon the prior contact-task complexity relationships as specified by Rosenthal (1966), as well as the prior contact-reward relationships found in the literature. In addition, further speculation regarding the possible mechanisms which are operating to produce these relationships will be developed. The first two hypotheses which this study entertained were not specifically based on the review of the literature but rather on other theoretical or methodological considerations:

- (1) significant differences in levels of responding should occur for different reward conditions (Terrell and Kennedy, 1957;

Walters and Foote, 1962)

- (2) significantly different levels of responding should occur on task S and task C with greater responding on task S.

In view of the summarization of the child studies involving prior contact, the following specific hypotheses are entertained by the present analysis:

- (3) a significant interaction between prior contact and type of reward should occur such that in the no reward condition, prior contact should result in increased levels of responding, while in the social reward condition, prior contact should result in decreased levels of responding
- (4) a significant interaction between prior contact and type of task should occur such that prior contact has a facilitating influence on the performance of a "more difficult task" (task C) and an equivocal influence on a "less difficult task" (task S)
- (5) a significant difference should exist between a familiar experimenter dispensing material reward on task S and an unfamiliar experimenter dispensing material reward on the same task (Rosenkrantz and Van De Riet, in press).

## CHAPTER II

### METHOD

Subjects: The subjects were 72 second and third grade boys with a CA range of approximately 6 to 8 years. All of the subjects were Caucasian as were all of the experimenters. This age group has been shown to respond favorably to marbles as a reward (Rosenkrantz and Van De Riet, in press) and is responsive to social reinforcement (Stevenson, 1961).

Experimenters: The experimenters were four male graduate and undergraduate students from the University of Florida. They were counterbalanced and unaware of the hypotheses under test in order to control for experimenter differences and expectancies (Rosenthal, 1966). Four male experimenters were chosen due to the differential effectiveness of social reward depending upon the sex of the child in relation to the sex of the experimenter. A cross sex effect has been found in a number of studies with older preschool and elementary school children (Gewirtz, 1954; Stevenson, 1961; and Stevenson and Allen, 1964).

The experimenters were given detailed instructions<sup>1</sup> regarding their behavior in the study in order to minimize individual experimenter differences and to prevent contamination of the various experimental treatment and control conditions.

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<sup>1</sup>See appendix A.

Tasks: Two tasks were used and are similar to those used by Crow (1964).<sup>2</sup>

In task S, subjects were presented with the task of underlining "S's" in a word list. Each child was given an individual copy of a second grade word list which contained words strung together in lines with no meaning given to the lines. This was done in order to prevent systematic differences due to reading or scanning the selection. All subjects were required to scan the selection looking for "S's" to underline. The "S's" were randomly scattered throughout the word lists.

Task C was similar to task S, but required the mastery of symbols for the underlining. Depending on the location of the S in the word, the subject was to underline the S in the following way: at the beginning S, at the end S, and anywhere else S. Task presentation was counterbalanced. The symbols were designed so as to have common elements, therefore setting the conditions for intratask competition between correct and incorrect response tendencies (Taylor and Spence, 1966).

Procedure: Baseline: The initial phase of the study began with an explanation of the first task (either S or C) for that subject. Each subject was examined to make certain he could identify the letter "S." For task S, the subject was told to underline every letter "S" in the word list given to him. In addition, he was told that when the experimenter said "stop" he was to circle the word he had just finished reading. The experimenter stopped the subject twice, after the first minute and again after the entire six minute baseline period had elapsed. The response frequency for each subject consisted of the number of correct letters underlined. The baseline for task C was executed in approxi-

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<sup>2</sup>See appendix B.

mately the same way. This task was explained and each subject was told to underline every "S" in the word list given to him, but in the special way previously described. The procedures of the baseline for both tasks were the same for all the subjects in the study.

Treatment: Nine groups were established: Group I, prior contact - with material reward; Group II, prior contact - with social reward; Group III, prior contact - with no reward; Group IV, prior contact control - with material reward; Group V, prior contact control - with social reward; Group VI, prior contact control - with no reward; Group VII,<sup>3</sup> no prior contact - with material reward; Group VIII, no prior contact - with social reward; Group IX, no prior contact - with no reward. After a baseline was established for each subject on both tasks, the subjects were randomly assigned to above groups. Four different investigators were used in order to evaluate individual investigator differences. The four experimenters were used in each of the nine groups. The testing phase for both tasks consisted of a three minute period in which response frequencies were obtained in the same way as in the baseline period.

Group I (prior contact - with material reward): In this treatment group, the subjects received marbles as rewards from a familiar experimenter for each underlined "S." The familiar experimenter was defined in terms of two periods of social interaction. The first period was approximately a half hour long and took place after the baseline period. The second period was approximately twenty minutes long and took place the next day, immediately before the test period. During

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<sup>3</sup>Groups VII, VIII, IX were run approximately two months after the other groups, and they contained more third grade students than second grade students.

the social interaction periods, the familiar experimenter attempted to express interest, concern and positive regard for each subject in this group. In general, he attempted to establish a positive relationship with his subjects. He joined the subjects in playing with games and toys appropriate for this age group.

Each subject in the group was told that when he underlined an "S," he would receive a marble and that the more correct letters he underlined the more marbles he would receive. The subject received marbles for correct responses in both task S and task C.

**Material Reward:** Marbles have been used as rewards in a number of studies (Erickson, 1962; Rosenkrantz and Van De Riet, in press; Walters and Brown, 1964). They have not been found to be a very strong reinforcer. The marbles were dispensed according to an operant conditioning paradigm. The subjects receiving marbles as rewards were informed of the contingencies prior to the beginning of the test period. After the child correctly underlined an "S," he received a marble which was placed in a transparent sack for him. This was carried out carefully so as not to interfere with his performance. The schedule for reward was continuous, reward followed every correct response. The child was told not to tell the other children about the marbles. This was done in order to prevent future subject expectancies of reward from influencing responding.

**Group II (prior contact - with social reward):** For this condition, the subject received praise as reward each time he correctly underlined the letter "S" in both the tasks. He received his reward from a familiar experimenter who was again defined in terms of the prior contact after the baseline period but before the testing period.

Social Reward: Social reward or praise has been shown to be an effective reinforcer with this age group (Stevenson, 1961). The social reward was also dispensed according to an operant conditioning paradigm, and was presented according to a continuous reward schedule. The social reward consisted of comments such as "good," "well done," or "fine," and immediately followed the underlining or an "S." The order of presentation of the socially rewarding comments was random.

Group III (prior contact - with no reward): For these subjects, there was no reward contingent upon responding. The experimenter is familiar and is defined as he was previously, in terms of prior contact.

Group IV (prior contact control - with material reward): In this group, the subject received a marble as a reward each time he correctly underlined the letter "S" in both tasks. In contrast to Group I, he received his reward from an unfamiliar experimenter, an adult with whom the subject's only previous contact was in the baseline phase of the study. These subjects did enter into two periods of prior contact but it was with a completely different experimenter, one whom they had not seen before the social interaction. With this one exception, the conditions for the prior contact control interaction periods were the same as they were for the prior contact interaction periods.

Group V (prior contact control - with social reward): In this treatment condition, the subject received praise as reward each time he correctly underlined the letter "S" in both tasks. He received his reward from an unfamiliar experimenter who was defined above. In this group, prior contact was provided by a completely different experimenter, one whom the subjects had not seen before.

Group VI (prior contact control - with no reward): For the subjects in this group, there was no reward contingent upon responding. The experimenter was unfamiliar and is defined as he was previously. Prior contact did occur, but with a different experimenter.

Group VII (no prior contact - with material reward): In this group, the subject received a marble as a reward each time he correctly underlined the letter "S" in both the word list tasks. He received his reward from an unfamiliar experimenter, an adult with whom the subject's only previous contact was in the baseline phase of the study. The difference between the prior contact control groups and the no prior contact groups is that there were no periods of prior contact between child and experimenter in the latter groups.

Group VIII (no prior contact - with social reward): In this condition, the subject received praise each time he underlined correctly in the experimental tasks. He received his reward from an unfamiliar experimenter. In this group, there was no prior contact of any kind provided by any experimenter.

Group IX (no prior contact - with no reward): In this control group, there was no reward contingent upon responding. The experimenter was unfamiliar and prior contact did not occur with any experimenter.

For each group, the experimenters were careful not to provide any unnecessary social reward for the subjects. Intentional social reward was dispensed during the first minute of the baseline periods for both tasks and in the social reward condition but at no other times.

Response Measures: The first minute of each of the two baseline periods was dropped for each subject. This was due to the social rewards during

this period. The period was considered as a trial period. There is good evidence that the average rate of child responding during the first minute of the test period correlates very highly with the rate of responding on successive five or six minutes of a given task (Stevenson and Fahel, 1961). The rate per minute of responding for each subject for the last five minutes of baseline was subtracted from the subject's rate of responding for the three minute testing period. The resulting difference score for each task was used as one indication of performance modification due to treatment. A second measure used was the rate per minute of responding for the three minute testing period. Since difference scores in conventional analyses of variance achieve many of the same advantages as analysis of covariance,<sup>4</sup> both an analysis of variance on difference scores and an analysis of covariance on testing period rates were calculated.

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<sup>4</sup>This is the case when the covariate is of the same nature as the dependent variable and is related in a linear fashion to the dependent variable (Kirk, 1968).

## CHAPTER III

### RESULTS

#### Baseline Analysis

A "t" test was calculated in order to determine whether task S was significantly different from task C. This was a test for correlated measures and it revealed that the subjects made significantly fewer correct responses to task C than to task S ( $t_{71} = 19.8$   $p < .001$ ). This calculation was performed on the baseline measures of responding for all the subjects employed and provides statistical evidence that task C is more difficult (in the intratask competition sense) than task S.

Two analyses of variance, one for task S and another for task C, were calculated for the baseline rates of responding. The summary tables of these analyses are set forth in Tables 1 and 2 respectively. They both have three factors, prior contact (A), type of reward (B), and individual experimenters (C).

For task S, the base rate of responding for levels of factor A was found to be significantly different ( $F_{2,6} = 6.8$ ;  $p < .05$ ) as were the levels of the AB interaction ( $F_{4,12} = 3.4$ ;  $p < .05$ ). For task C, the base rate of responding for levels of factor A was also found to be significantly different ( $F_{2,6} = 11.3$ ;  $p < .01$ ) as were the levels of the AB interaction for this task ( $F_{4,12} = 4.4$ ;  $p < .01$ ).

Table 1

## Baseline Analysis of Variance for Task S

Source	Error Term	F	Sum of Square	Deg. of Freedom	Mean Square
A (Prior Contact)	AC	6.8203**	32.33331	2	16.16666
B (Reward)	BC	0.4599	2.333333	2	1.166666
C (Experimenter)	N.S.	5.152778	3	1.717592	
AB	ABC	3.3503**	81.83328	4	20.45831
AC	N.S.	14.22216	6	2.370359	
BC	N.S.	15.22219	6	2.537031	
ABC	N.S.	73.27693	12	6.106411	
S (ABC)		383.4946	36	10.65263	

Note: \* at .1 level

\*\* at .05 level

\*\*\* at .01 level

Table 2

## Baseline Analysis of Variance for Task C

Source	Error Term	F	Sum of Squares	Deg. of Freedom	Mean Square
A (Prior Contact)	AC	11.3312***	62.11108	2	31.05554
B (Reward)	BC	1.0585	5.361109	2	2.680554
C (Experimenter)		N.S.	14.38889	3	4.796296
AB	ABC	4.4276***	47.55542	4	11.88885
AC		N.S.	16.44426	6	2.740709
BC		N.S.	15.19441	6	2.532401
ABC		N.S.	32.22179	12	2.685148
S (ABC)			219.9947	36	6.110964

Note: \* at .1 level

\*\* at .05 level

\*\*\* at .01 level

No significant differences were found in baseline responding for any other effect or interaction. Of particular significance, is the fact that the different experimenters (factor C) did not result in significantly different base rate responding.

#### Treatment Analysis

Since the analyses of variance on the base rate levels of responding revealed significant differences due to sampling procedures, the analyses of variance on difference scores were calculated only for comparison purposes and not to test the hypotheses under consideration. Parton and Ross (1965) have pointed out that baseline performance may account for group differences in changes in performance if groups differ in base rate levels of responding. These authors suggest an analysis to control for base rate performance which fails to add information to that provided by the separate analyses of base rate and difference scores that are reported in most studies of this general type (Hill and Moely, 1966).

Stevenson and Hill (1966) suggest a way to control for base rate effects in analyses of difference scores by blocking on base rate within groups in the experimental design. This statistical procedure is capable of identifying a significant source of variance but unfortunately provides no means of controlling for the possible effects resulting from the relationship between base rates and change scores. A procedure which does provide statistical control for this potential source of bias is an analysis of covariance. Parton and Ross (1965) feel that there are two considerations which argue against the use of analysis of covariance in this type of study. The first consideration is the

failure of the studies they reviewed to meet the assumption of linear regression of the criterion measures on the covariate. This first consideration does not appear to be a major problem according to Kirk (1968). Kirk points out that analysis of covariance does not require an a priori assumption concerning linear regression but instead determines the most suitable relationship between the dependent variable and covariate from the data. Still it was with this first consideration in mind that an analysis of covariance on the test period rates was calculated. Correlation coefficients between the test period rates and base rates for tasks S and C were respectively .81 and .59. In contrast correlation coefficients for difference scores and base rates for tasks S and C were respectively .03 and -.31, indicating much less of a linear relationship for the latter measures. The second consideration which Parton and Ross put forth is the relatively low reliability of base rate scores in the studies they reviewed. This second consideration seems somewhat meaningless, since the treatment of base rates by blocking or any other statistical procedures makes generally the same assumption regarding the reliability of these measures. Stevenson and Hill (1966) have data to suggest that base rates of similar simple motor responses are reasonably reliable and have reported correlations for over four months as high as .86.

The first analysis of the difference scores which was calculated is a four factor analysis of variance with three fixed and one random factor with repeated measures on the task factor. Since there were repeated measures (factor D), a subject effect (S) is nested under factors A (prior contact), B (type of reward), and factor C (individual

experimenters). The summary table of this analysis is presented in Table 3. The summary table reveals that only factor B, type of reward, resulted in significant variations in responding ( $F_{2,63} = 24.5$ ;  $p < .01$ ). The variation in scores attributable to the individual experimenter factor (C) is not significant. In addition, none of the interactions involving this factor are significant. Since this factor has no theoretical significance and was only included to account for individual experimenter differences as a control, it was dropped from the analysis. It was concluded that the procedure used to standardize the experimental tasks over experimenters was effective.

The second analysis of variance which was computed is presented in Table 4. This analysis does not consider the individual experimenter factor (C). Since there were base rate differences, this analysis of variance of difference scores is methodologically suspect, but it does suggest that prior contact per se does not significantly contribute to the variations in responding. It suggests rather that prior contact interacts with the type of reward and the type of task to contribute to response variation. The comparable analysis of covariance is presented in Table 5 and it supports this contention.

In order to consider the specific hypothesis which this study attempts to deal with, an analysis of covariance on treatment rates was calculated and the summary table is presented in Table 5. A number of the F values exceed their respective critical values.

Reward is a significant variable in the determination of rates of responding ( $F_{2,63} = 6.0$ ;  $p < .01$ ). Inspection of the data reveals that the mean rate of responding was lowest for the no reward condition,

Table 3

## Summary Table for Analysis of Variance for Difference Scores

Source	Error Term	F	Sum of Squares	Deg. of Freedom	Mean Square
A (Prior Contact)	AC	3.9038	8.761032	2	4.380516
B (Reward)	BC	24.5000***	118.5716	2	59.28580
C (Experimenter)	S (ABC)	.2231	2.851379	3	.9504598
D (Tasks)	CD	3.0497	13.68998	1	13.68998
AB	ABC	2.9540	76.99318	4	19.24829
AC	S (ABC)	.2625	6.732620	6	1.122103
BC	S (ABC)	.5660	14.51894	6	2.419823
AD	ACD	2.7159	23.97150	2	11.98575
BD	BCD	0.1628	1.971670	2	.9858351
CD	SD (ABC)	1.2383	13.46708	3	4.489025
ABC	S (ABC)	1.5241	78.19214	12	6.516011
ABD	ABCD	2.0827	18.78809	4	4.697021
ACD	SD (ABC)	1.2173	26.47923	6	4.413205
BCD	SD (ABC)	1.6707	36.33948	6	6.056580

Table 3 (continued)

## Summary Table for Analysis of Variance for Difference Scores

Source	Error Term	F	Sum of Squares	Deg. of Freedom	Mean Square
S (ABC)			153.9105	36	4.275292
ABCD	SD (ABC)	.6221	27.063664	12	2.255303
SD (ABC)			130.5095	36	3.625262

Note: \* at .1 level

\*\* at .05 level

\*\*\* at .01 level

Table 4

Summary Table for Analysis of Variance for Difference Scores

Source	Error Term	F	Sum of Squares	Deg. of Freedom	Mean Square
A (Prior Contact)	S (AB)	1.0771	8.761032	2	4.380516
B (Reward)	S (AB)	14.5781***	118.5716	2	59.28580
D (Tasks)	SD (AB)	3.6879**	13.68998	1	13.58998
AB	S (AB)	4.7338***	76.99318	4	19.24829
AD	SD (AB)	3.2288**	23.97150	2	11.98575
BD	SD (AB)	N.S.	1.971670	2	.9858351
S (AB)		256.2056	63		4.066754
ABD	SD (AB)	1.2653	18.78809	4	4.697021
SD (AB)		233.8596	63		3.712057

Note: \* at .1 level

\*\* at .05 level

\*\*\* at .01 level

and highest for material reward with responding for social reward falling in between the other two conditions. Three Tukey post hoc comparisons revealed that both social ( $q_{2,63} = 7.9$ ;  $p < .01$ ) and material reward ( $q_{2,63} = 8.5$ ;  $p < .01$ ) resulted in significantly greater responding than the no reward condition. There was not a significant difference between responding for material reward or social reward ( $q_{2,63} = .63$ ).

The second hypothesis under consideration stipulated that the two tasks used would result in significantly different rates of responding with greater rates of responding on task S than on task C. The analysis of covariance presented in Table 5 indicates that this variable approaches significance ( $F_{1,62} = 3.0$ ;  $p < .1$ ). Inspection of the mean rate of responding for the two tasks reveals greater responding to task S than to task C.

The third hypothesis stipulated a significant interaction between prior contact and type of reward. This was supported by the analysis of covariance reported in Table 5 which revealed that the interaction between prior contact and reward conditions approaches significance ( $F_{4,63} = 2.3$ ;  $p < .08$ ). A number of Tukey post hoc comparisons were calculated in order to specify more clearly the nature of the interaction which is presented graphically in Figure 1. The post hoc comparisons revealed that there was a significant difference in responding in the no reward condition as a function of the conditions of prior contact. A relatively high level of responding occurred in the prior contact condition, while the no prior contact condition resulted in the lowest level of responding and the prior contact control condition resulted in responding somewhere in between. Prior contact resulted in a significantly greater level of responding than the no prior contact ( $q_{2,63} = 3.5$ ;  $p < .05$ ) in the no reward condition.

Table 5

## Analysis of Covariance on Test Period Rates

Source	Sum of Squares	Deg. of Freedom	Mean Square	F	p
A (Prior Contact)	12.0681	2	6.0341	1.2972	
B (Reward)	64.2468	2	32.1234	6.9060***	.01
D (Tasks)	11.9636	1	11.9636	3.0029*	.1
AB	42.0120	4	10.5030	2.2579*	.08
AD	26.1062	2	13.0531	3.2764**	.05
BD	4.3669	2	2.1835	0.5481	
S (AB)	293.0432	63	4.6515		
ABD	15.4478	4	3.8619	0.9694	
Covariate	151.0432	1	151.0432	37.9126***	.01
SD (AB)	247.0073	62	3.9840		

Note: \* at .1 level

\*\* at .05 level

\*\*\* at .01 level

Tukey post hoc comparisons were calculated for the social reward condition as a function of prior contact (see Figure 1). These revealed that although the familiar experimenter dispensing social reward resulted in lower rates of responding during the test period, this reduction in responding was not statistically significant ( $q_{2,63} = 1.6$ ). There was a greater rate of responding for the prior contact control condition than in the no prior contact condition but the difference was not significant ( $q_{2,63} = 1.3$ ).

Post hoc comparisons calculated in order to determine whether prior contact had an influence on material reward revealed no significant difference in responding for material reward as a function of the three conditions of prior contact. Table 6 contains the adjusted means for the AB interactions.

Prior contact seems to have had an affect as to whether the systematic presentation of reward was significantly different from the no reward condition (see Figure 2). Post hoc comparisons of the data revealed that in the prior contact condition the three conditions of reward did not result in significantly different rates or levels of responding. In fact, the rate of responding of the prior contact-no reward condition is not significantly different from the highest condition of responding that of the prior contact control-material reward condition. In contrast in the other two conditions, prior contact control ( $q_{2,63} = 3.3$ ;  $p < .05$ ) and no prior contact ( $q_{2,63} = 3.8$ ;  $p < .01$ ), the systematic presentation of reward either social or material was effective in significantly increasing responding over the no reward condition. This can be seen quite clearly in Figure 2.

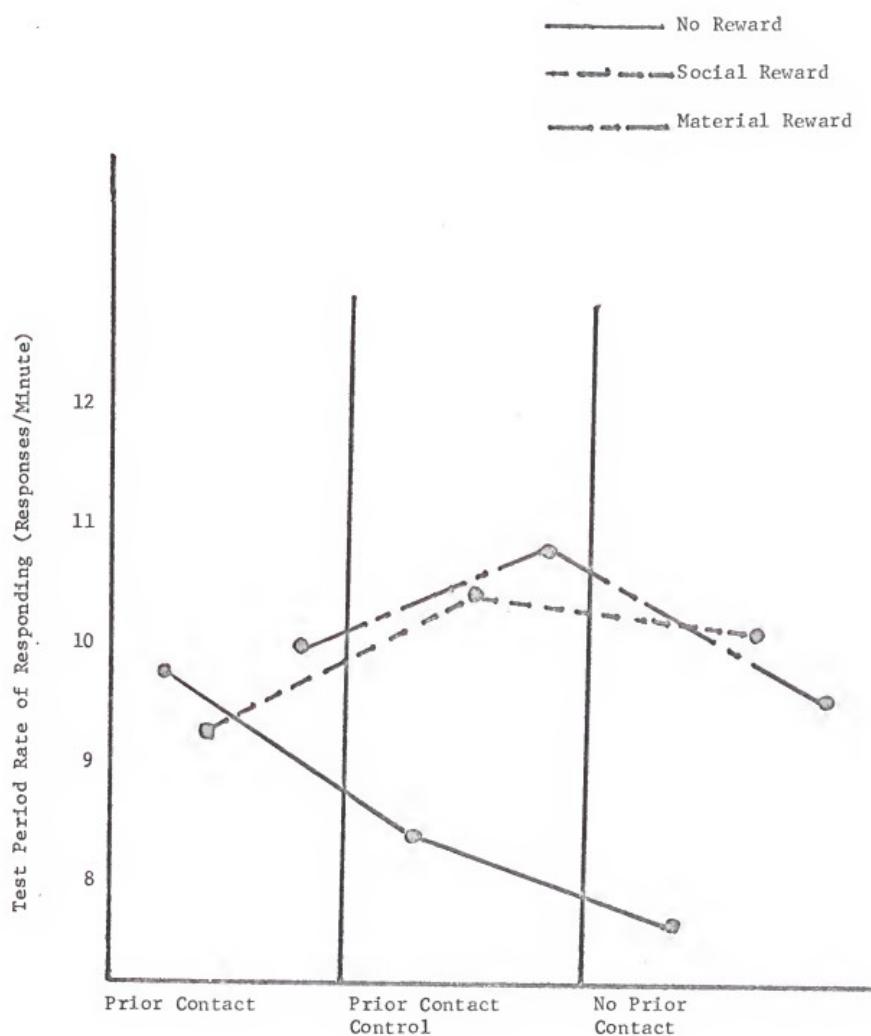


Figure 1. Prior Contact-Reward Interaction

Table 6  
Means for the Prior Contact-Reward Interaction Adjusted for the Covariate

Factor A	Factor B			
		No Reward	Social Reward	Material Reward
Prior Contact	9.836	9.450		10.008
Prior Contact Control	8.446	10.450		10.726
No Prior Contact	7.725	10.195	9.672	

Test Period Rate of Responding (Responses/Minutes)

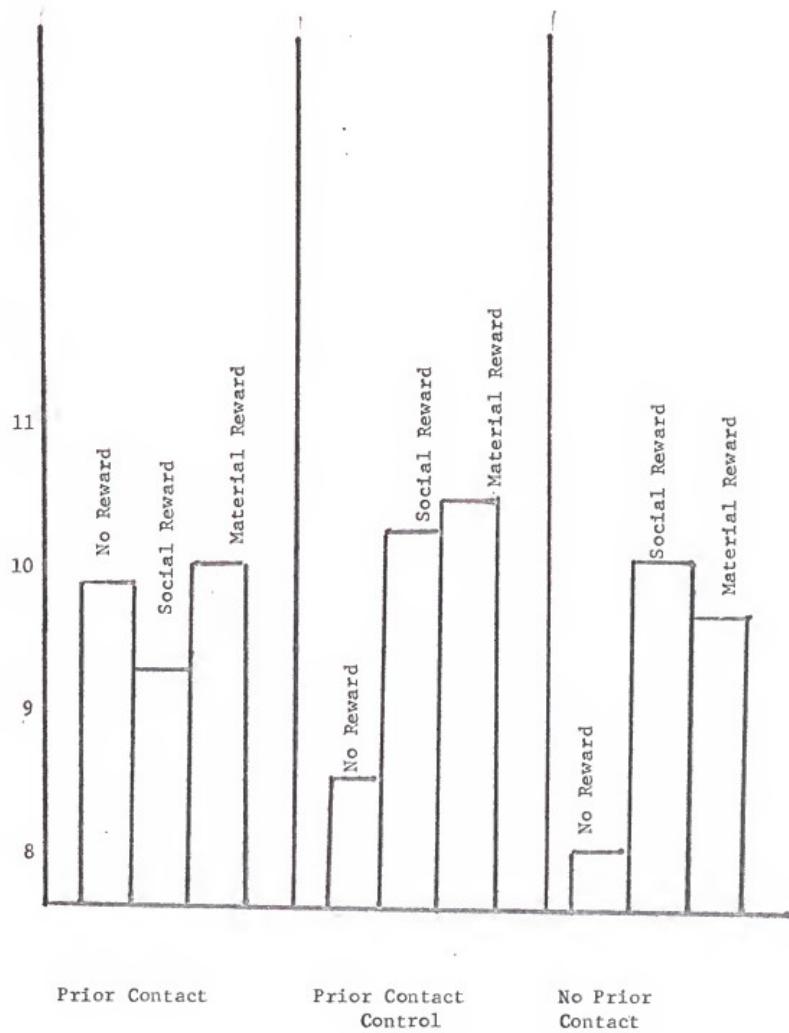


Figure 2. Prior Contact-Reward Considerations

The fourth hypothesis under test in this analysis stipulates that a significant interaction between prior contact and type of task should occur. It should be such that prior contact has a facilitating influence on the performance of task C (statistically shown to be the more difficult task) and an equivocal influence on the performance of task S. A number of post hoc comparisons were made to study this statistically significant interaction ( $F_{2,62} = 3.3; p < .05$ ). These revealed that prior contact did significantly influence responding on task C. The condition of prior contact did result in greater levels of responding on this task (see Figure 3). The difference between the prior contact condition and the no prior contact condition was statistically significant for this task ( $q_{2,62} = 4.2; p < .01$ ). In contrast, this was not the case for task S, there was no statistically significant difference between prior contact on task S and the no prior contact condition on this task. Table 7 contains the adjusted means for the AD interaction.

Additional post hoc comparisons revealed that only in the prior contact condition responding to task C was not significantly less than responding to task S. Under the condition of prior contact control responding to task S was significantly greater than responding to task C ( $q_{2,62} = 4.2; p < .01$ ). In addition, in the no prior contact condition, responding to task S was significantly greater than responding to task C ( $q_{2,62} = 4.2; p < .01$ ). These prior contact-task relationships can be seen clearly in Figure 4.

The fifth hypothesis of this study was examined using a planned comparison to determine whether an unfamiliar experimenter dispensing material reward on task S resulted in higher levels of responding than

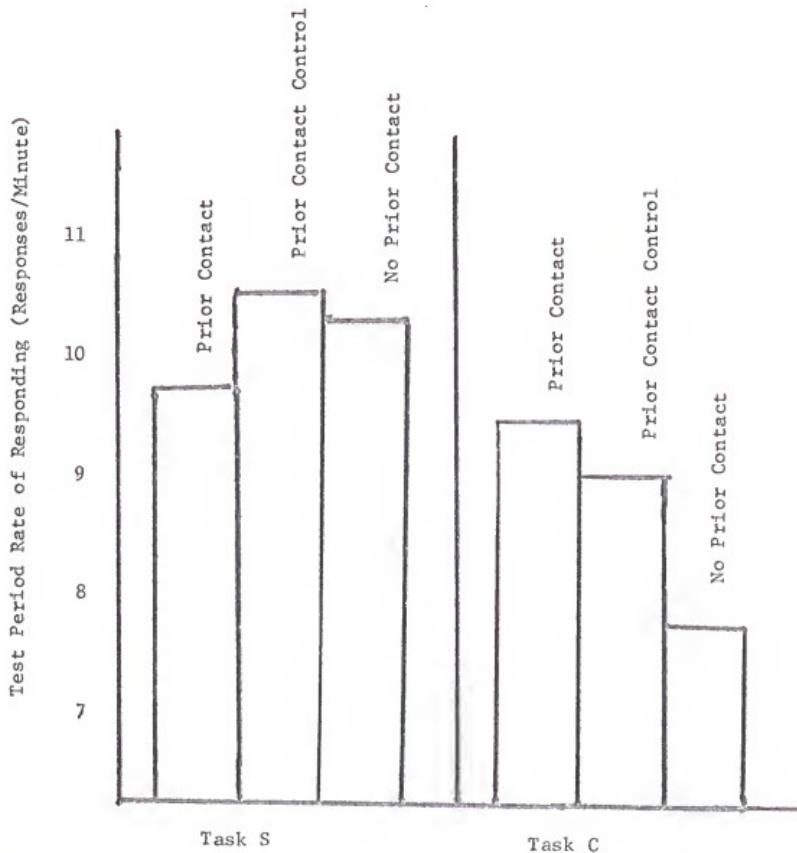


Figure 3. Prior Contact-Task Considerations

Table 7  
Means for the Prior Contact-Task Interaction Adjusted for the Covariate

Factor A	Factor D
Prior Contact	Task S
Prior Contact Control	9.969
No Prior Contact	10.710

Factor A	Factor C
Prior Contact	Task C
Prior Contact Control	9.560
No Prior Contact	9.038

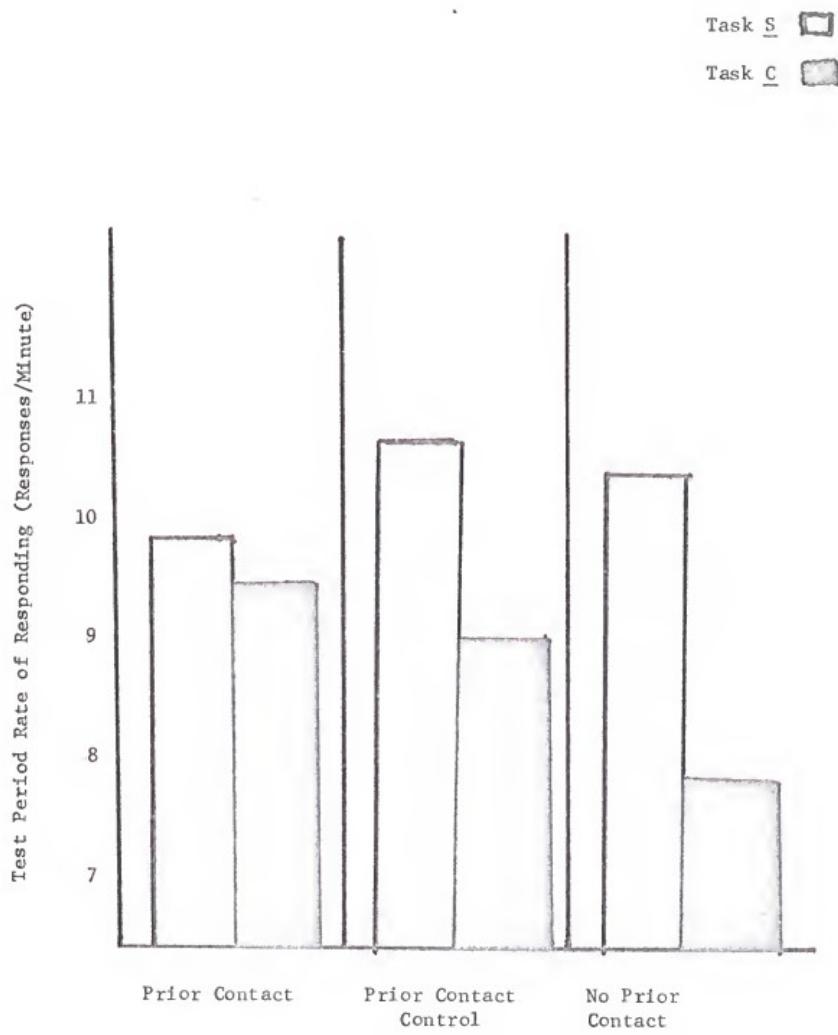


Figure 4. Prior Contact-Task Interaction

did the familiar experimenter dispensing material reward on the same task. There is some evidence in the present analysis to support this hypothesis. In the prior contact control condition, the unfamiliar experimenter dispensing material reward on task S resulted in a significantly higher rate of responding than the familiar experimenter in the prior contact condition ( $t_{63} = 2.33$ ;  $p < .05$ ). This difference was significant as would be predicted by the Rosenkrantz and Van De Riet study (in press) mentioned earlier.

## CHAPTER IV

### DISCUSSION AND CONCLUSIONS

This study indicates that positive prior contact between a child and an adult experimenter may interact with the type of reward and with the type of task to influence the child's performance. This summary statement of the results of the present analysis is quite consistent with the literature in this area of investigation. The following discussion will be concerned primarily with a detailed examination of these interactions as they are explicated by the present analysis. It should be pointed out that this study has a great deal of difficulty testing the relative merits of the various theoretical mechanisms considered, since the frameworks from which these mechanisms have evolved are not formulated sufficiently to permit unequivocal derivations. Most theoretical explanations made in this section are therefore of the post hoc variety. In addition, all conclusions drawn from this study must be limited to a very prescribed population of second and third grade boys. Many more experimental analyses will have to be undertaken before there is a sufficiently reliable body of knowledge on which to construct a systematic theory of relationships between prior contact, reinforcement, task variables, and some relevant personality variables.

Prior contact per se was not a significant factor in response variation. The fact that prior contact interacts significantly with

both reward variables and task variables suggests a dual mechanism underlying the effects of prior contact. This study of course only considered positive prior contact which was approximately an hour in length and therefore these results can not be generalized to conditions of prior contact which are significantly longer or shorter than this period. The relationships between types of reinforcement, task variables and prior contact probably vary as a function of the length as well as the type or quality of prior contact.

Significant differences in responding occurred for different reward conditions. Both marbles and praise were significant determiners of increased child performance. Although marbles have not been found to be a strong reinforcer with older children (Erickson, 1962), they appear to work quite well with this younger age group. Marbles had been determined prior to the investigation to be a meaningful reward for this particular group of second and third grade boys. In addition, in an earlier investigation with a similar group of second and third graders, Rosenkrantz and Van De Riet (in press) used marbles to increase subject responding. In the social reward condition, supportive comments were found to result in increments in responding in support of studies by Hill, 1965; Hill and Moely, 1966; Stevenson and Hill, 1965; and Stevenson and Snyder, 1960. Stevenson and Hill (1966) feel that a consistent pattern exists in which normal children under nonstressful conditions respond more to social reinforcement than nonreinforcement. These authors conclude that social reinforcement tends to have a facilitating effect on the performance of normal children tested under nonstressful conditions. Stevenson and Hill (1966) also point out that

nonreinforcement serves as an appropriate control by which to assess the facilitating effects of social reinforcement when normal children are tested under nonstressful conditions. For atypical children or for normal children tested under stressful conditions, nonreinforcement operates in a more complex fashion apparently as a result of these children's greater need for some form of informative feedback from the adult. As expected, the no reward condition had the lowest level of responding, but an interaction between prior contact and reward conditions qualifies the interpretation of the various levels of the overall reward condition. The fact that there was no significant difference between responding for social reward and responding for material reward is perhaps due partially to the fact that social and material rewards may have equivalent effects when the experimenter attempts to establish a warm non-threatening atmosphere (Dorart *et al.*, 1965).<sup>1</sup> Since this was supposed to be the case in both the prior contact and prior contact control conditions, the fact that material and social rewards were not significantly different determiners of responding is not entirely unexpected.

The presence of prior contact in the no reward condition resulted in increased levels of responding relative to the no prior contact-no reward condition. This finding supports the hypothesis of a significant interaction between prior contact and the reward conditions. This findings confirms those of Sacks (1952) and Kass and Stevenson (1961) and also supports the findings of Sgan (1967) and Hill and Stevenson (1965)

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<sup>1</sup>The strength of the material reward is probably a critical variable in this result.

although these latter investigations are not directly comparable to this analysis. In contrast to these studies, Berkowitz (1964) found prior contact in a no reward condition to decrease responding in normal adult males. There exist two apparently important differences between the study by Berkowitz and those previously mentioned. First and probably the foremost is the fact that Berkowitz used adults while the other studies mentioned used young children. The second major difference is in the type of task used. Berkowitz used a very simple finger lift response to an auditory stimulus while both the study by Sacks and the one by Kass and Stevenson used more difficult tasks. The present analysis attempted to use tasks which differed in difficulty, but it did not find a significant prior contact-reward-task interaction. It did, however, find a significant prior contact-task interaction. It therefore appears that both the type of task used and the age and background of the subjects employed (Berkowitz used hospital patients who probably looked at psychological experimentation in a different manner than young children) are largely responsible for the differences found. This particular aspect of the interaction between prior contact and reward conditions corresponds to a well known "common sense" phenomenon. If a child has had favorable prior contact with an adult, and that same person asks the child to perform without some type of contingent reward, the child will be more likely to comply than if the adult is a stranger. This phenomenon is documented in literature (Sacks, 1952) and is related to the concept of "rapport."

There is of course the possibility that some form of subtle social reinforcement was being dispensed in the prior contact-no reward condition

which was more effective than any which might have been dispensed in the no prior contact-no reward condition or in the prior contact control-no reward condition. If this was the case, it was probably very similar to that which may be responsible for "experimenter expectancy effects." In support of this possibility, Rosenthal (1966) finds that "experimenter expectancy effects" increase with repeated contact.

A related explanation is found in Rosenthal's recent book, Experimenter Effects in Behavioral Research (1966). Rosenthal cogently argues for the influence of experimenter expectancies in determining the results of psychological investigations. In various subtle ways, the experimenter communicates his own expectations to his subjects. Although the experimenters were not aware of the particular hypotheses under test, it is undoubtedly possible that their own expectations coincided with some of the formal hypotheses. This concordance may have been responsible for subtle changes in their behavior which in turn influenced subject responding. This explanation is somewhat weakened by the fact that all four experimenters must have conveyed information based on similar expectations.

In looking at this particular aspect of the prior contact-reward conditions interaction from a slightly different point of view, it is possible to incorporate Rosenthal's conclusions regarding "warmth of the experimenter." Rosenthal (1966) indicates that "warm" experimenters result in better performances by their subjects. He indicates that it is reasonable to assume that more influence is exerted by "warmly" perceived experimenters than by "cold" or "coldly" perceived experimenters. In support of this relationship, there is experimental evidence

that the "warmth" an experimenter conveys in the experiment is significantly related to improved subject performance (Crow, 1964; Ware, Kowal and Baker, 1963). It seems reasonable to assume that those subjects in the no reward condition who experienced favorable prior interactions with the experimenters perceived the experimenters as "warmer" and this therefore resulted in greater levels of responding. This was possible since the no reward condition was not complicated by consequences for responding.

A similar and related explication of this particular aspect of the prior contact-reward conditions interaction is based on the theoretical position that the familiar experimenter probably acquired secondarily reinforcing qualities through his association with the favorable interaction periods which in the absence of other rewards became prepotent. In addition to the reinforcing capacity which the familiar experimenter probably developed, there are discrimination properties which were probably present (Redd and Birnbrauer, 1969). In the prior contact-no reward condition, the familiar experimenter probably became a cue for the social and material rewards which had been presented in the social interaction periods.

Stevenson and Hill (1965) point out that the failure of an adult to provide a child with some form of information about the adequacy of his performance (no consequences for responding) may produce significant and complex effects on performance. It cannot be assumed that a no reinforcement condition always provides an appropriate baseline from which to evaluate the effects of reinforcement. It appears that positive prior contact modifies this consideration additionally by

having inherent in it information about the adequacies of the child's initial performances (largely in terms of an adult's responses to it) and additional information regarding the general nature of the adult experimenter's behavior. Both of these situations have been shown to be extremely important in child responding. Research studies have shown that success conditions enhance child responding (Kass and Stevenson, 1961; Stevenson and Hill, 1965). A number of researchers have demonstrated that the experimental introduction of nurturance enhances both imitative and simple motor learning (Bandura and Huston, 1961; Bandura, Ross and Ross, 1961; Rosenblith, 1961; Stevenson, 1965).

An explanation basing the effects of prior contact entirely on anxiety put forth by Rosenthal (1966) and supported by the work of Walters and his associates (Walters, 1965; Walters and Parke, 1964) is difficult to develop in this study. If we assume that prior contact, in general, reduces anxiety about being contacted by a stranger, and this lowers responding relative to a no prior contact condition, we are incorrect. The opposite result takes place in the no reward condition. This situation therefore requires a more comprehensive explanation.

Hill (1967) proposes that social reinforcement (and by extension prior contact) may have two effects, one derived from an incentive value (the adult experimenter becomes a conditioned reinforcer) and the second is derived from its potential for reducing anxiety (its discriminative capacity). It is suggested that, for most children, social reinforcement or prior contact will tend to enhance performance at simple tasks due to the incentive value of supportive comments from adults. It is also suggested by Hill that if such comments lower the

child's anxiety and level of motivation then social reinforcement or prior contact will serve to reduce the child's rate of response. The rate of response is thus a joint function of the incentive value of the comments from the adult and the child's motivational level derived from such sources as the child's level of anxiety. If this theoretical position is applied to the no reward condition, it does fit the data to some degree. In the prior contact-no reward condition, both an incentive and an anxiety factor seem to be playing a role in the child's performance. The incentive value comes from the supportive comments from the prior social interactions and the child's anxiety is a function of the non-responsive adult (Crandall, Good and Crandall, 1964). This study did not adequately measure the anxiety level of the children involved. Both Hill's (1967) position and evidence from a study by Cox (1966) suggest that the child's initial level of anxiety interacts significantly with prior experiences and the type of experimenter (parent, stranger, or teacher) to influence responding.

In an interesting study using a somewhat different methodology which makes direct comparisons difficult, Cox (1966) found that prior contact conditions between second grade boys and adults resulted in both increased and decreased performances depending upon the initial anxiety level of the child. If we can assume that the subjects in the no reward condition of this study for the most part had a low to moderate level of initial anxiety, then the results of this analysis are quite consistent with those of Cox. He found that prior contact in the sense of "familiarity" with adults present in the room resulted in increased responding (for the low anxiety group) and that no prior

contact resulted in decreased responding. The presence of any "familiar" person such as teacher, mother, or peer was associated with a response increment for the low anxious subjects. Cox used no reinforcement during the test period.

There was no significant difference in the social reward conditions as a function of varying conditions of prior contact. The presence of prior contact did result in decreased levels of responding relative to the no prior contact-social reward condition but this decrease in responding was not statistically significant. This does not conform to this study's third hypothesis which was derived from the literature of social reinforcement (Berkowitz, 1964; Dorart *et al.*, 1965; Erickson, 1962; Gewirtz and Baer, 1958; Shallenberger and Zigler, 1961; Simkins, 1961; Stevenson and Knights, 1962; Stevenson, Keen, and Knights, 1963). Favorable prior contact should have significantly decreased responding for social reward but did not do so to a significant degree. Dorart *et al.* (1965) have shown that methodological considerations which are apparently quite small and trivial such as minor differences in experimenter behavior can yield large differences in the experimental outcomes involving social reinforcement. For example, these authors have evidence to suggest that periods of experimenter behavior as brief as two to three minutes can have significant effects on child responding for social reinforcement. This is therefore one possible source for the discrepancy. Another line of reasoning for uncovering the mechanisms of this particular outcome seems to be found in studies that have determined that a successful pretraining experience results in increased responding. The major difference in these two general types of studies

appears to be the amount of social reinforcement actually dispensed. The successful pretraining experience appears to have a beneficial effect on performance if excessive quantities of social reinforcement are not dispensed or if social reinforcement is not used in the test period. The former situation appears to be the case in the social reinforcement condition of this study. There were both an element of a successful pretraining experience and an element of satiation for social reinforcement resulting in a nonsignificant effect due to prior contact.

Another way of looking at this somewhat unexpected result is to compare it with the no reward condition. Since prior contact in the no reward condition significantly increased responding, if we were to use this condition for a comparison, the reduction in responding in the prior contact-social reward condition, although not significant, becomes more meaningful. It seems possible that the response increasing aspects of prior contact were being countered by some response decreasing mechanism such as satiation for social reinforcement. Since the prior contact conditions may not have been sufficient to allow for complete satiation (as is indicated by the failure of the prior contact-social reward condition to be significantly below the no prior contact-social reward condition), the results of the prior contact-no reward condition seem more understandable, since they are what would be expected by the "valence position" (Berkowitz, Butterfield, and Zigler, 1965).

It should be pointed out that another source of variation is what constitutes satiation for the individual child. This was probably not a

problem in light of the fact that the majority of the studies considered have used shorter periods of interaction to obtain a satiation effect. Although the length of prior contact periods appears to be long enough, the actual behavior of the experimenters is suspect. They were told to "play games with" and "interact with" the subjects in their groups. They were not told specifically to use social rewards during the interaction periods. Undoubtedly, they all did use social reinforcement but in somewhat varying degrees. This was the case even though they all spent exactly the same amount of time and engaged in the same activities with their subjects.

The comparison between prior contact-social reward condition and the prior contact control-social reward condition corresponds closely to an aspect of the study by Berkowitz, Butterfield, and Zigler (1965). These authors found a sizable attenuation in playing time when experimenters were switched. When a different adult interacted with the child prior to the experimental task, social reinforcement was less effective. This was taken by these authors as evidence against the "satiation or social drive position." This difference was not significant in the present study but was in the direction predicted by the "satiation position" since the prior contact control condition resulted in a greater level of responding than the prior contact condition.

The final aspect of the prior contact-reward condition interaction involves material reward. There were no significant differences in the material reward condition as a function of lengths of prior contact used. This corresponds quite well to the findings of Dorart *et al.*, 1965; Erickson, 1962; and Simkins, 1961. The results of the study by Erickson

(1962) indicated that 15 minutes of positive prior contact had no significant effect on a marble reward relative to 15 minutes of just being in the room without actual social reinforcement being dispensed. It should be pointed out that this latter condition is somewhat different from the no prior contact condition which was used in this study.

Only in the situation in which a familiar experimenter was dispensing material reinforcement for responding on a simple task does prior contact appear to have a differential effect. The prior contact control and no prior contact conditions resulted in greater levels of responding than the prior contact condition for material reward on a simple task. This difference was significant in the prior contact control condition. This result can only partially be explained in terms of the "satiation position." The fact that this result is seen with young children (Rosenkrantz and Van Dé Riet, *in press*) but does not occur as readily with adults (Rosenkrantz, Jaffee, and Van De Riet, 1969) adds some additional support to a satiation explanation. Young children show a marked responsiveness to social reinforcement which tapers off and decreases with age (Dorart et al., 1965). An explanation using the mechanisms of satiation for social reinforcement in this situation requires that the mere presence of an adult be socially reinforcing. There is some experimental evidence to support this conclusion (Cox, 1966). The weaknesses in this explanation are of course that social reinforcement was not overtly dispensed during the test period, and that satiation did not completely take place.

A supplementary explanation in terms of anxiety is suggested since a simple task is implicated in the prior contact-material reward-

task interaction. An unfamiliar experimenter could result in some degree of increased anxiety which then results in an increment in performance. The fact that the task effect is an important element in this interaction is difficult to account for by a pure "satiation position."

There were differences in responding on the tasks with greater levels of responding on task S than on task C. These differences would have been of greater magnitude, approaching those of the baseline period, but a practice effect probably wiped out part of the difference. An interpretation of this main effect is somewhat clouded by the significant interaction between prior contact and the type of task. An analysis of this interaction revealed that prior contact did significantly influence responding on task C, the more difficult task, resulting in a higher level of performance relative to no prior contact. This result supports the work of Kanfer and Karas (1959), Kass and Stevenson (1961), and Sacks (1952). In contrast, prior contact did not result in an increase in responding on task S. This result supports the work of Crow (1964). This significant interaction strongly suggests that anxiety plays a part in the theoretical mechanism determining differential rates of responding in this analysis. The significant interaction between prior contact and task complexity is strongly supported by the study by Crow (1964) who used very similar tasks. She found that "warm experimenters" did not make a great deal of difference on responding on simple tasks but did result in increased performance on more difficult tasks, a result which directly parallels that of this analysis.

In summary, the influence of prior contact varied as a function of the type of reward and type of task. The lengths of prior contact

used had some effect on the no reward and the social reward conditions. The influence of prior contact was only statistically significant in the no reward condition. For this condition, prior contact resulted in increased levels of responding. In the material reward condition, prior contact and a simple task resulted in decreased levels of responding. This particular combination of reward and task variables produced a decrease in responding relative to the no prior contact and prior contact control conditions. Prior contact interacted significantly with the type of task used. It had a facilitating influence on the "complex task" and an equivocal effect on the "simple task."

These results are difficult to explain in a consistent fashion from any one theoretical position. Since prior contact interacts with both reward and task variables, a dual mechanism is suggested as underlying its effects. This dual mechanism may be based on the incentive value of the prior contact and its capacity for the reduction of anxiety.

APPENDIX A  
DIRECTIONS FOR EXPERIMENTERST

When you initially meet the subject be friendly but not overly friendly. Do not spend time in conversation but answer the child's questions briefly if you can. Complete the cover sheet information for every child in the baseline period.

Baseline phase: This is the same for all subjects. Each experimenter will see 18 subjects for this part of the study. The children are randomly assigned to the experimenters. Each child is seen separately in order to complete two tasks, task C and task S. The tasks will be introduced as follows:

"I have a game I want you to play and it goes like this.

You know what an S looks like (draw a small case S for the subject)":

(Before going further, check your order card to see if task C or task S is administered first to the subject.) If you start with task C, you continue by saying:

"I would like you to underline all these S's (point to the task) in a very special way. If the S comes at the beginning of the word, underline it like this s (draw) for example in the word snow. If the S comes at the end of a word underline it like this snow (draw) for example in the

word cows. Finally, if the S comes anywhere else in the word underline it like this  (draw) for example in the word house. Do you understand?"

If the subject indicates that he understands, give him task C and start timing, if not explain the task again. After this task is completed give the directions for task S.

If you start with task S you continue the introductory remarks by saying:

"I would like you to underline these S's (point to the task). Just put one line under every S like this S for example in the word sisters there are three S's to underline."

After this task is completed, give the directions for task C.

During the first minute of the tasks, smile and occassionally say "good" when the child underlines an S, if it is done correctly. Do not offer help to the subject unless asked directly for help. You can only help the child during the first minute of the baseline period. Do not spend much time helping the child and make your explanations very short. After the first minute of the baseline period is up, ask the child to circle the word he has just finished reading. If he doesn't know where he is, you can estimate it based on the last underlining. Then start the child again from the circled word and time for five minutes more. During this five minute period for both the tasks, you may not praise or smile at the child. In general, during this period, do not speak to him if it can be avoided. At the end of this five minute period, thank the child and send him back to his room.

Experimenter 1 will see subjects .

1, 3, 4, 6, 8, 9, 10, 11, 16, 32, 37, 46, 53, 57, 61, 65, 69

Experimenter 2 will see subjects

2, 5, 7, 13, 18, 23, 24, 31, 42, 47, 48, 50, 54, 58, 62, 66, 70

Experimenter 3 will see subjects

14, 15, 17, 19, 22, 28, 29, 30, 36, 39, 43, 44, 51, 55, 59, 63, 67, 71

Experimenter 4 will see subjects

12, 20, 21, 25, 26, 27, 34, 35, 38, 40, 41, 45, 52, 56, 60, 64, 68, 72

Treatment phase: Each experimenter will see six children under each of the two conditions of this phase. No tasks are presented and the experimenters engage in social interaction with the subjects.

Prior contact: In this condition, the experimenter will play games with the same child whom he saw in the baseline phase, allowing the child to win in most cases. The experimenter may play any of the games with the subject which are provided. This condition will consist of one half hour period and a second period twenty minutes long. The first period immediately follows the baseline phase. The second period will come the following day.

Prior contact control: In this condition, the experimenter will play games with a child whom he did not see in the baseline phase again allowing the child to win in most cases. The experimenter may play any of the games with the subject which are provided. This condition will also consist of two periods arranged as in the first condition.

No prior contact: In this condition, no adult experimenter will have any contact following the baseline with the subjects in this group.

Prior contact condition:

Experimenter 1 will see subjects 3, 4, 8, 11, 16, 32.

Experimenter 2 will see subjects 2, 7, 13, 33, 42, 47.

Experimenter 3 will see subjects 14, 15, 19, 28, 29, 44.

Experimenter 4 will see subjects 12, 20, 21, 27, 35, 45.

Prior contact control:

Experimenter 1 will see subjects 5, 26, 34, 36, 41, 48.

Experimenter 2 will see subjects 1, 9, 17, 25, 38, 43.

Experimenter 3 will see subjects 18, 23, 31, 37, 40, 46.

Experimenter 4 will see subjects 6, 10, 22, 24, 30, 39.

Test phase: There are three conditions of the test phase and each experimenter will see six subjects in each of the three conditions. Two of the four subjects are familiar with the experimenter and four are unfamiliar with him. The test period is three minutes long. Let the child underline appropriately for each task for three minutes without interruption. The order of task presentation is again counterbalanced. The tasks are presented in exactly the same way, just re-read the instructions for task presentations given in the beginning of the experimenter directions. In two of the three test conditions, rewards follow each response.

Material Reward Condition: Explain tasks again using the same directions, being sure to check order card for the task that comes first for the subject. In this condition after a correct response is made, the child receives a marble. Place each marble in the transparent sack provided. Tell each child:

"After every correct S you underline, you will receive a marble to keep. The more S's you underline, the more marbles you will receive."

Experimenter 1 will see subjects 1, 4, 10, 16, 65, 69 in this phase.  
Experimenter 2 will see subjects 2, 23, 31, 33, 66, 70 in this phase.  
Experimenter 3 will see subjects 14, 19, 30, 36, 67, 71 in this phase.  
Experimenter 4 will see subjects 12, 26, 27, 38, 68, 72 in this phase.

Social Reward Conditions: Explain tasks again using the same directions, being sure to check the order card for the task that comes first for the subject. In this condition after a correct response is made, the experimenters say "good," "very good," "that's fine," or "good job" in a random order.

Experimenter 1 will see subjects 3, 6, 11, 46, 57, 61 in this phase.  
Experimenter 2 will see subjects 5, 13, 47, 48, 58, 62 in this phase.  
Experimenter 3 will see subjects 17, 29, 43, 44, 59, 63 in this phase.  
Experimenter 4 will see subjects 20, 25, 45, 60, 64 in this phase.

No Reward Condition: In this condition (for both tasks) nothing is done following a correct response. After explaining the tasks again, tell the child to begin underlining. Be sure to check the order card to see which task comes first for the subject.

Experimenter 1 will see subjects 8, 9, 32, 37, 49, 53.  
Experimenter 2 will see subjects 7, 18, 24, 42, 50, 54.  
Experimenter 3 will see subjects 15, 22, 28, 39, 51, 55.  
Experimenter 4 will see subjects 21, 34, 35, 41, 52, 56.

## APPENDIX B

### TASK C

Under road go ever on bike for sale from outer the moon  
black player go promise from go to market funny faces sand  
colored pop pole the great paper yellow cars where fishing  
country road happy had been happy enough with best horns raced  
all over bright new soon was hardly any paint lost nails buzz  
son could pulled in front where women head it shakes before  
board paint wooden want paste early the next afternoon the  
doorbells went to the door and found least buzzed the doorbells  
standing there asked the boy and her father wanted larger bikes  
signs high newly painted bike to the boy his bar under that  
tool please oil what you need all said right wheels decided  
horn hike when outside on evening have to go out for a boys  
from outer while boy stay mother cried you used to leave along  
when we lined in sitter know but family lived in ours building  
there here alone house let watch us alone afraid each will  
stay a best thought for a minutes or two finally you are bed  
beside yourself wall not be gone long while later she ready  
made popcorn kitchen table as soon driven off in the car  
roger and placed chairs interested water then swift then they

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Note: Tasks were typed with a primary typewriter and they have been re-typed for this appendix.

was ready were to watch they soon find but who ahead in popcorn was do not eating noise were very in the race that state suddenly there against a loud bang the window wind had blown outside ran to look any rain going minute now almost bang suddenly there a was overhead and great rooms even his spaces the light in the rooms what that terrible bang made landed in our lightning the two boy moved toward uneasy flashed legs outside looks something that looked like from outer maybe trying knocked space the boys let yelled run to there mother boys like years they turned and doorway holding cried flashlight aerial hanging out there wind blew it just face think it was think set to meet journey cold through visit like a slice and a jolly silvers place holding high lonely tall never frosty could sometime yet stop squealed was their way on to the way street time pushing huge park finally the bus move or take came back and some through outer unknown lights kite maybe it whisper then he began to yell outside wanted runs but their feet would move like seemed they turned and in the doorway helps who are asked a man from outer window now shouts trying to get in the ball bus father finally made their whole crowd stop then they went along with the crowd toward stand a loud happy yell has behind third are base out in every play makes the home team began sitting finally down the began to come down promise the men went down one two three ball stays ten minute think went by the ball player did not soon think he forgotten wait come racing field just go was large

three times low branch to go said reach climb closer asleep  
then a fierce howl could cut through the dogs would walk  
then ever daylight came out with useless with worried party of  
across you two have us greatly cried looking you down all day  
we stumbled dog whistled two wolves the frightened dog over  
and at dashed at the stick tomorrow be bring feeling fallen  
milk dress school the coming along who her brother going back  
worshiped he stepped around ran down he held front door the  
stops look wheel of his spring levers may not work science  
test wheeled the at best name almost it not against there  
are a million maybe two million score of some it pulled hard  
that curb four crashed hard into almost came racing around  
the paper snap and went high in the air went the papers  
they across he pumped out of bed and walked around the footboard  
was about to test another invention then he jerked the strings  
through the pulleys and the covers went into place

### TASK S

the and story tree friend a funny way to help hurry lost  
box a party there to find the big still easy helps who  
did it yourself away a new kind of was say away pet too  
much did you help for shovel goose a party snow big funny  
telephone the picture the wish the fast turtle car and the  
children wise rabbit makes the old man new hat a party  
goose party the wind machine who little gray truck small  
car and the see the black pie and the big whistle look  
how spring be for you what look at boot said friend funny  
way help hurry there to find helps the box a party for  
penny fun lost the painter penny after the ran outside wait  
for to drive up our grandmother came visit hats and we each  
get a room of short house in a box in the dress getting  
more cream to churn when sudden remembered that he had not  
started to cook dinner he filled a lag just then the poor  
man remembered the cow herself started the other end of the  
outside soon of across oh not real owner found dog still of  
such we all take care of him slowly all the water wants  
show today is the first day you go home but your mother  
breakfast the dressed grandmother on sat to see we want to  
in sleep we thought all the but we visit thought we would

all things love yours but now we want to go home sleep want  
to ride our own bikes said that a came it could be a be  
some opened the he watched our eyes then he got up enough  
yet to grasp his and but the little elephant could trunk  
will seems until her mother end of his zoo keeper leaving  
waved to behind excited seemed now hear noises just using  
up and held the dog carefully he against the felt left front  
jaw pigs on when were chasing us carried the puppy to the  
house raced stop the the boy laughed after had the puppy  
paw all gets well all that chased see three I can please  
the monkey climbed on the back of the crossed a tall tree  
would be growing on his tried to pull the tree shake you  
make be large and he be strong some need help more dash  
even monkey easily even not long before was did he was a  
neighbor show mother away new kind of pet say do it yourself  
too much is a for fast ask new one spring look at black  
bottle little like a new one because take will come along  
and house it is big hat what friend left thing know some  
about them let will come along soon ask about it came school  
pie for everyone try big hat take someone of your friend  
she in our left know thing way about just later chair step  
her mother chair being soft to have on tree haircut down  
saw play had to have step her lost you are being had trees  
on haircut what have was chair cookie let eat every good  
time cookies help eat last play no lets little chair feed  
till again no be us will you make it soon well we flashed

way down sorry he am please let them know down little cars  
sorry try it come park on my house keep that thing away  
want so help is splash up and down row the his the each  
dashed each time on or first here the gave up slowly would  
ever about boast long legs the boy cooked see in the paper  
lost some he found nothing about any dog lost lunch new  
friend while he this wished when he came out the dog soon  
then the dog held out its may we keep him and take case  
was the shaking you may take care of the splash it to he  
looking footstep when he came back into the room the squirrel  
on shirts gave a leap and strange to peanuts all at once  
house had a glad for too as on slide our put up flag in  
minutes almost will look sat for clean helpful thing busy  
clean you did it all have a pet street do want to get  
please everyone when went out wish you did have not yes the  
park with flying fish over one ever the soon at look as  
cow sleep chair mother her you are being funny see had to  
have thing on tree haircut was on the play chair kind his  
down on the play saw feed tell wet no time for you wish  
you pet did a do want to yes go for a ride on the wheel  
sisters try to have it come out tree get house the when  
went over to look at park fish got the cow to store kite  
on it everyone want cry hear busy house you are to help  
pig for apple guess little boy before long sad plane and  
there was it wise before long apple little boy told it horse

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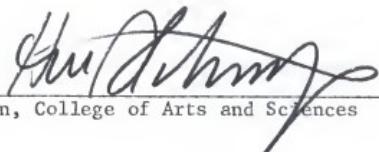
#### BIOGRAPHICAL SKETCH

Arthur Litman Rosenkrantz was born July 16, 1942 in New York City. In June, 1960 he graduated from Coral Gables High School, Coral Gables, Florida. In June, 1964, he received the degree of Bachelor of Arts with a major in Psychology from the University of Miami, Miami, Florida. In February, 1965, he enrolled in the Graduate School of Temple University, Philadelphia, Pennsylvania. He received his Master of Arts with a major in Psychology a year later. From April, 1966, until the present time he has pursued work toward the degree of Doctor of Philosophy. He is presently interning in clinical child psychology at the Convalescent Hospital for Children, Rochester, New York.

Arthur Litman Rosenkrantz is married to the former Maita Gail Beyer. He is a member of ALPHA PHI OMEGA, PSI CHI, and a student affiliate of the American Psychological Association.

This dissertation was prepared under the direction of the chairman of the candidate's supervisory committee and has been approved by all members of that committee. It was submitted to the Dean of the College of Arts and Sciences and to the Graduate Council, and was approved as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

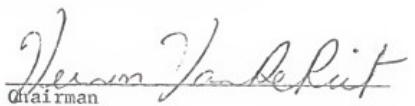
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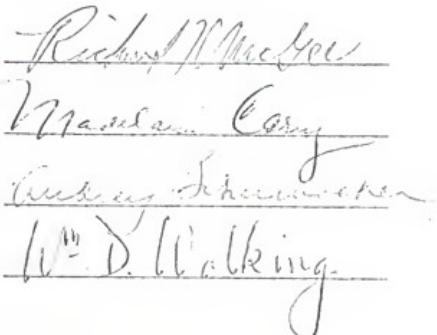
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